

DOCUMENT RESUME

ED 183 426

SE 030 426

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 TITLE Health Activities Project (HAP): Action/Reaction Module.
 INSTITUTION California Univ., Berkeley. Lawrence Hall of Science.
 SPONS AGENCY Robert Wood Johnson Foundation, New Brunswick, N.J.
 PUB DATE 79
 NOTE 23p.: For related documents, see SE 030 421-425; Not available in paper copy due to copyright restrictions
 AVAILABLE FROM Hubbard Scientific, P.O. Box 104, Northbrook, IL 60062 (no price quoted)
 EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
 DESCRIPTORS *Classroom Materials: Elementary School Science: Elementary Secondary Education: Health Activities: *Health Education: *Human Body: Junior High Schools: *Science Activities: Science Education: Worksheets

ABSTRACT

Contained within this Health Activities Project (HAP) learning packet are activities for children in grades 5-8. Design of the activities centers around the idea that students can control their own health and safety. Within this module are teacher and student folios describing activities in timing, improving, and practicing to improve reaction time. A technique card is also included for averaging data. (CS)

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HAP HEALTH ACTIVITIES PROJECT

ACTION/REACTION MODULE

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Folios Included in This Module

WHAT'S HAPPENING? This is a teacher's information folio describing the contents and use of the program.

Reaction Time. The students time and compare their own reactions to light, sound, and touch stimuli.

Improving Reaction Time. The students explore the effect of a training program on their reaction times when they respond to a light stimulus. This activity introduces the students to systematic collection and analysis of data.

Let's Manipulate. By dropping pieces into matching holes, the students practice their eye hand coordination and discover that practice can improve their performance.

SE 030 426

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University of California,
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WHAT'S HAPpening?

TEACHER'S
INFORMATION
FOLIO

WHAT IS HAP?

The Health Activities Project (HAP) primarily involves fifth- to eighth-grade students with their own health and safety through hands-on, discovery-approach activities. By investigating their own bodies, the students learn firsthand how their bodies function and what they can do. Most importantly, the students discover that *they* can make changes in the way their bodies perform. HAP's main purpose is to make students more aware of the control they have over their own health and safety.

Is there any order to the HAP activities?

The activities fall under four categories or areas of emphasis. We call these categories **modules**. HAP activities may be used independently, but work best when used in sequence within the module framework. Activities that *must* be conducted in a certain sequence contain the appropriate directions in their "Setting Up" sections.

SIGHT AND SOUND Module

Mask Relay. The students play bounce-ball relay with and without vision-restricting masks and compare the results.

Field of Vision. Each student measures his total field of vision and compares it to the area in which he can see clearly enough to read.

Animal Masks. By wearing vision-modifying masks that simulate the fields of vision of different animals, the students discover how different fields of vision necessitate different kinds of behavior.

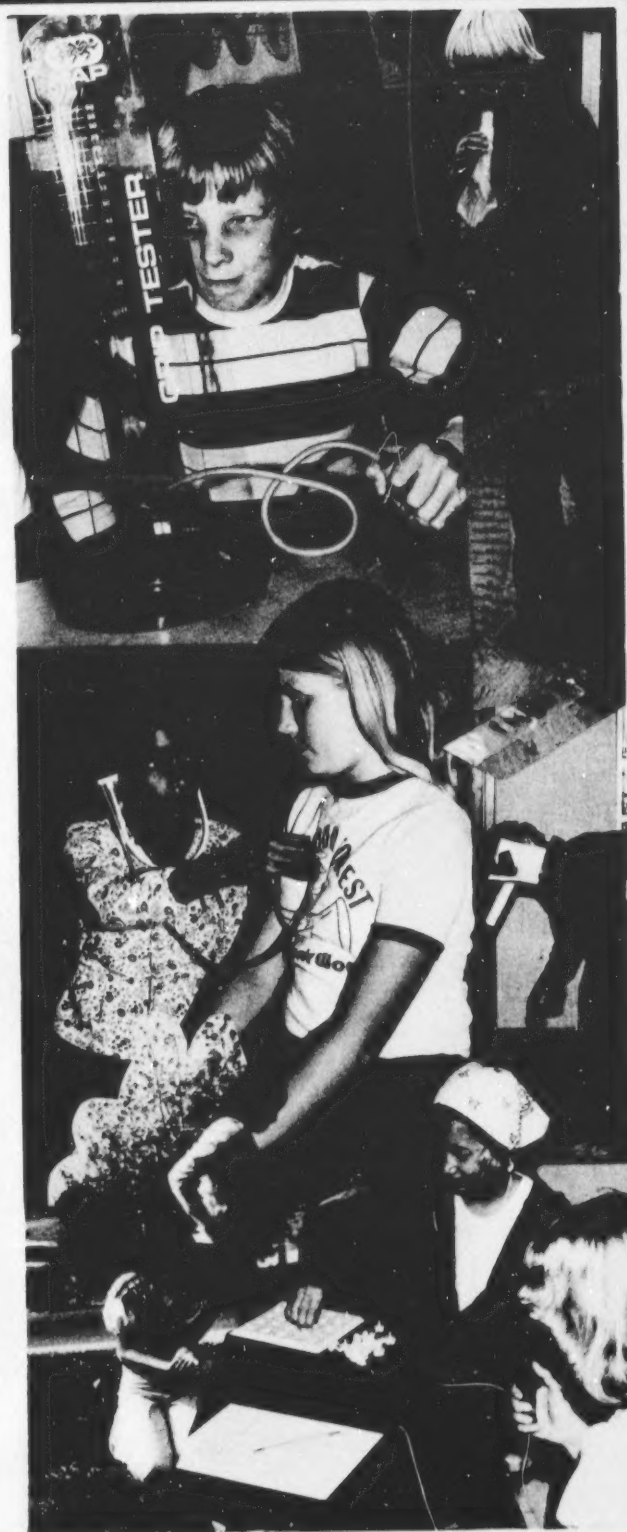
Pinhole Viewer. The students find out how the amount of light and type of lens affect images produced by a pinhole viewer.

Look, Listen, and Find. By playing two games in which they must rely on nonverbal communication, the students compare the usefulness of sight signals and sound signals.

Where Are You? The students test their ability to pinpoint the location of sound sources and discover one advantage of having two ears.

ACTION/REACTION Module

Reaction Time. The students time and compare their own reactions to light, sound, and touch stimuli.



Improving Reaction Time. The students explore the effect of a training program on their reaction times when they respond to a light stimulus. This activity introduces the students to systematic collection and analysis of data.

Let's Manipulate. By dropping pieces into matching holes, the students practice their eye / hand coordination and discover that practice can improve their performance.



HEART FITNESS AND ACTION Module

Exploring Heartbeats. The students use stethoscopes to locate their hearts and to listen to their heartbeats. They discover how various body positions affect the heartbeat rate.

Exploring Pulse. Each student locates her pulse points, measures her pulse, and compares her pulse rate to her heartbeat rate.

Pulse Recovery. After exercising, the students monitor the recovery of their pulse rates from the increased rate during exercise to their resting rates.

Shape Up. By monitoring their pulse recovery during a period of physical conditioning, the students discover that training can improve physical condition and pulse recovery time.

Grip Strength. After determining the strength of their grips, the students train for one week to improve their grip strength.

BREATHING FITNESS Module

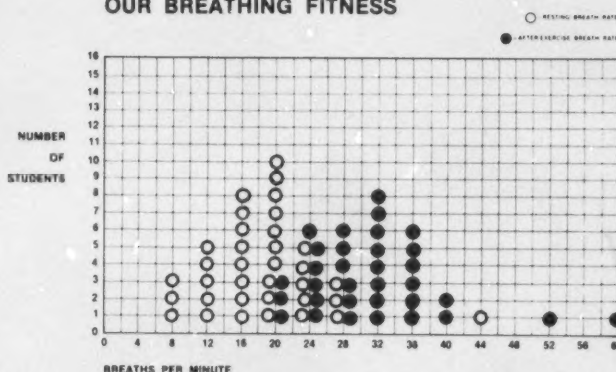
Exploring Breath Rates. After learning how to measure their breathing rates, the students investigate the effects of breathing style, breath holding, and exercise on breath rate.

Breath Recovery. The students monitor the recovery of their breath rates after sprinting and after jogging and compare the results.

Breath Control. The students measure and practice improving their breath control.

Measuring Lung Volume. The students measure their maximum lung volumes and investigate the relationship between lung volume and height.

OUR BREATHING FITNESS



How do you lead a HAP activity? Your role as a HAP teacher is that of a facilitator (one who sets the stage) of learning rather than that of a purveyor of facts. Through many classroom trials we have found that, in many situations, discovery through student activity is more successful than spoon-fed knowledge. The procedure that we recommend you follow is to quickly introduce the activity, demonstrate any special procedures and equipment, and present the students with the challenge or task. Most of the allotted time should be reserved for *student* exploration. Each activity is designed to let your students learn through their own explorations. Follow the activity with questions and discussions that reinforce the students' experience with the ideas and concepts introduced in the activity.

What do you do while the students participate in the activity? While your students work, you have the opportunity to move about the room and spend your time with individuals or small groups. You can participate, lend assistance when it is needed, help students record results, or ask questions that stimulate further activity.

Be flexible. Sometimes your students may become involved in explorations or ask questions that do not lead in the direction you have planned. When this happens, be flexible. These situations can serve as interesting points of departure and often spur further exploration and learning on the part of the students.

How do you lead the discussions? The discussion at the end of the activity is an opportunity for the students to compare discoveries, review the class results, voice their opinions, and share their experiences. Avoid monopolizing the discussion; act rather as a catalyst for discussion.

THE FOLIOS

Thoroughly acquaint yourself with the contents of the activity folio before attempting to lead the activity. Each folio is laid out in a similar format so that you can quickly locate the information you need in each activity.

OVERVIEW

The Overview provides you with a capsule description of the activity.

HEALTH BACKGROUND

This section not only provides you with background information on specific health concepts, but also outlines the activity's general health significance. *Do not read this section to the students!*

MATERIALS

All materials for each activity are listed here. Materials to be provided by the teacher are marked with an asterisk. Such materials include easily obtainable equipment and duplicated Student Sheets. All other equipment is provided in the kit.



SETTING UP

This section outlines the activity's time and advance-preparation requirements. Whenever possible, have your students assist you with the preparation.

THE ACTIVITY

Suggestions on introducing the activity, demonstrating any procedures and equipment, and carrying out the activity are found in this section.



This logo indicates parts of the activity in which the students are actively involved in their explorations.

Analyzing the Data

The questions in this section are designed to help students compare discoveries and results and to interpret the results of the activity.

HEALTH APPLICATIONS

This section contains situational questions that are designed to "bring home" the health or safety significance of the activity. HAP recommends that you wait a day or two after finishing the activity before initiating these discussions.

HAP SIDETRIPS

These additional challenges may be used to extend the scope of the activity for the whole group or for interested students.



This symbol keys you to "Take-Home Ideas": activity-related exercises that the students can take home.



In some cases, the last HAP Sidetrip suggests an activity in which parents and children can participate during an "Open House" night at school.

THE INSERTS

Equipment Cards, Technique Cards, and duplicator masters of the Student Sheets for this module are contained in the module packet. You may wish to insert these sheets into the appropriate folios. The duplicator masters are provided for your use in making photocopies or

your own spirit masters. Do not write on the masters. Use them only for your reference and for the copies you make for the students.

HINTS

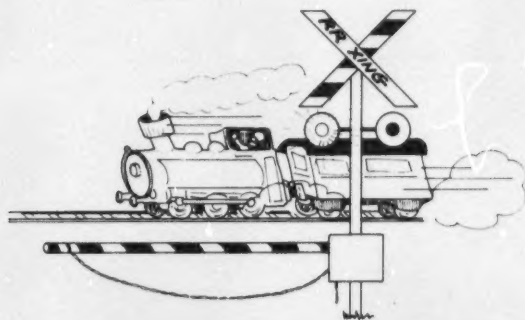
Over the years we have discovered some general approaches that improve the flow of learning in the experiential science approach employed by HAP. You probably know and use some of these techniques already, but for those of you who are unfamiliar with the experiential approach, we mention some techniques here.

1. **Equipment.** Make sure that all of the required equipment is present. Do not assume that equipment is in the box.

2. **Preparation.** Check the "Setting Up" section of the folio to find out what you have to do *before* the activity. For instance, in *Reaction Time* the batteries must be installed and the timers checked before you conduct the activity.

- **Charts.** Before posting HAP charts for your class, make sure that all data (adhesive dots, crayon markings) from previous classes have been removed.

3. **Distributing the Materials.** Do not distribute the materials until you have finished the introduction and any demonstrations, and the students have been primed with a challenge and are ready to begin. If distributed earlier, equipment often diverts the students' attention from any instructions you may still have to give.



4. **Interaction.** Hands-on, discovery-approach activities generate a great deal of student-to-student verbal interaction. While participating in HAP activities, children often spontaneously exchange observations and ideas, so be prepared for higher than normal noise levels. This activity-oriented peer interaction is a valuable part of the learning process in HAP activities, so don't discourage it. You should, of course, keep the noise level reasonable (i.e., the children don't have to shout).

WE WANT TO HEAR FROM YOU



These HAP activities have been through both local and national trials with over 2,000 children in regular classrooms. Even so, we know that you will have contributions to make to the Publisher, and we encourage you to do so. Any suggestions on format, equipment, and procedures are extremely important to future revisions. Please submit your ideas to: Dr. Roy Gromme, HAP Project Coordinator, Hubbard, P.O. Box 104, Northbrook, Illinois 60062.

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Health Activities Project
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HAP

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REACTION TIME

ACTION/REACTION Module



OVERVIEW

The students time and compare their own reactions to light, sound, and touch stimuli.

HEALTH BACKGROUND

Reaction time is the amount of time an individual takes to respond to a stimulus such as a light, a sound, or pressure. A response provides evidence that the individual has seen

the light, heard the sound, or felt the pressure. Quick reactions are important any time someone must react to a sudden occurrence such as a stop signal changing to red, a child running into the street, or a car running a stop sign. Riding a bicycle, playing baseball, and walking across a street are situations in which quick reactions are necessary.

Reaction time is related to the general condition of an individual's health. Fatigue can significantly slow down an individual's reactions. Some medicines (such as allergy pills) and depressants such as alcohol and other drugs slow down an individual's reaction time. Failure to consider factors that affect reaction time can have serious health consequences, the most obvious example being the number of automobile accidents traced to the drunk driver.

MATERIALS

For each team of four:

- 1 reaction timer
- 4 AA-cell batteries
- 4 copies of Student Sheet RT*

For the class:

- duplicator master of Student Sheet RT

*Provided by the teacher.

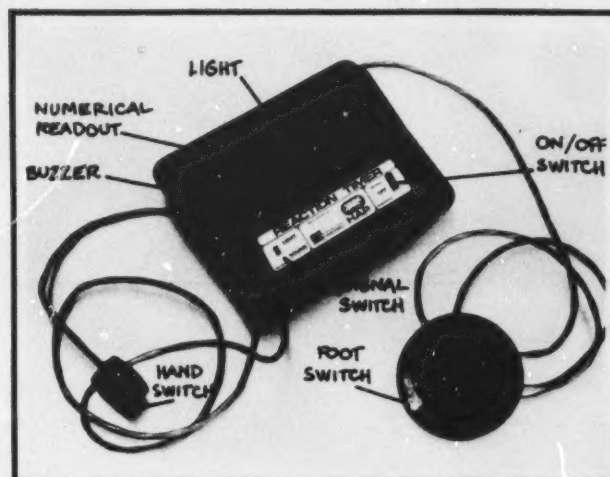
SETTING UP

Suggested Time:

- Plan for 45 to 60 minutes for this activity.

Preparing for the Activity

1. Prepare the timers. Place four AA-cell batteries into the battery holder of each reaction timer as shown in the diagram on the holder. (Note: Remove the batteries after the activity if the timers will be stored for a while.)



2. Familiarize yourself with the use of the reaction timer.

- **Timing Switch.** The switch on the right side of the timer's face is for recording elapsed time. For hundredths of a second, push the switch *down*. For seconds, push it *up*. To turn the timer off, push the switch to the *middle* position.
- **Light and Sound Switch.** This switch is on the left side of the timer's face. To activate the light signal, push the switch *up*. To activate the sound signal, push the switch *down*.
- **Hand Switch.** Press and release the hand switch (the smaller of the two disks) to activate the chosen signal and the timer's clock.
- **Foot Switch.** Step on the foot switch (the larger disk) to stop the clock and turn off the signal. You can then read the elapsed time from the readout.
- Pressing and releasing the hand switch again automatically resets the clock to zero and starts it timing.

3. Duplicate the Student Sheets.

THE ACTIVITY

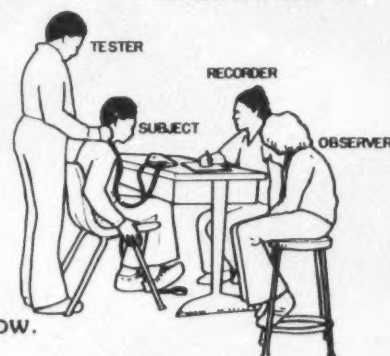
Introducing the Activity. While the class is working quietly, drop an object that will make a loud noise when it lands. Use the students' reactions as an opener to a short discussion on reacting to unexpected, sudden noises.

SUBJECT's Name _____

Reaction Time Student Sheet RT

TIMING YOUR REACTIONS

Do you react more quickly to light, to sound,
or to touch?



RECORDER: Record the SUBJECT's reaction times in the boxes below.

TRIALS	REACTION TIMES IN HUNDREDTHS OF A SECOND TO:		
	LIGHT	SOUND	TOUCH
Trial 1			
Trial 2			
Trial 3			
TOTAL			

Divide each
total by 3.

+ 3

+ 3

+ 3

Average Reaction Time			
--------------------------------------	--	--	--

SUBJECT: I reacted fastest to _____

List three things you do every day in which reaction time is important to your safety.

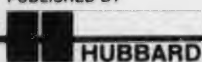
1. _____

2. _____

3. _____

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HEALTH ACTIVITIES PROJECT



1. Ask the students how they obtain information from and about their surroundings. (They will probably mention sight, hearing, smell, and touch.)

2. Explain to the students that today they will time their reactions to sight, sound, and touch stimuli.

- Tell them that these are three of the major sources of information available to most individuals.

Demonstrating the Reaction Timer. Bring a team of four to the front of the room to demonstrate the reaction timer.

1. The Set Up. Organize the students as follows:

- The SUBJECT, whose reactions are timed, sits in front of the timer with one foot to the right of the foot switch.
- The TESTER, who gives the signals, holds the hand switch and stands behind the SUBJECT. (The hand switch must be kept out of the sight of the SUBJECT.)
- The RECORDER sits across from the SUBJECT. The timer's face should be towards the RECORDER.
- The OBSERVER sits to one side of the SUBJECT. The OBSERVER should be able to see the SUBJECT's feet.

2. Timing Reactions to Light

- The RECORDER makes sure the SUBJECT can see the lamp on the timer.
- The RECORDER then moves the left switch up to the light position and the right switch down to the hundredths-of-a-second position.
- The OBSERVER makes sure that the SUBJECT's foot remains on the floor to the right of the foot switch until the timer light goes on.
- The TESTER presses and releases the hand switch, lighting the lamp and starting the clock.
- As soon as the SUBJECT sees the light, he steps on the foot switch, which stops the clock.
- The RECORDER reads the elapsed time from the readout and records it on the SUBJECT's Student Sheet in the "Light" column.

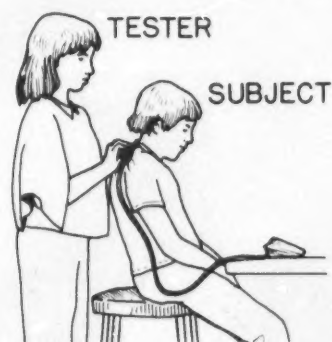
- When everyone is ready for the next trial, the TESTER just presses and releases the hand switch again. (This action automatically resets the clock to zero and starts it running.)

3. Timing Reactions to Sound

- Keeping the timer in the same position (so that the SUBJECT cannot see the numerical readout), the RECORDER moves the switch from the light position down to the sound position.
- The rest of the testing procedure is the same as for "Timing Reactions to Light."
- If the sound signal is too loud, fasten one or two strips of tape over the buzzer hole on the left side of the timer.

4. Timing Reactions to Touch (or Pressure)

- The RECORDER moves the signal switch back up to the light position.
- The TESTER positions the reaction timer so that neither the light nor the numerical readout is visible to the SUBJECT.
- The TESTER stands behind the SUBJECT and firmly presses the hand switch against the SUBJECT's shoulder blade. (The pressure of the switch against the SUBJECT is the touch stimulus and also starts the clock.)
- The rest of the testing procedure is the same as for "Timing Reactions to Light."



Timing Reactions

1. Explain the procedure.
- Each student tests his reaction to each stimulus three times (a total of nine trials).

- All four students should test their reactions to one stimulus before moving on to the next stimulus.
 - Each student should have a turn in each of the four team positions.
2. Divide the class into teams of four, giving each team a reaction timer and four Student Sheets.
 3. Let the students conduct their tests.
 - Observe the different teams at work, helping them with procedures when necessary.
 4. After the students have finished, make sure each participant has nine results recorded in the table on the Student Sheet.
 - Review, if necessary, how to find an average result for each set of the three trials.
 5. Collect the equipment.
 - Make sure all the timers are turned off.

Analyzing the Data. After all the teams have finished, draw three columns (Light, Sound, and Touch) on the chalkboard.

WHEN DO YOU REACT FASTEST ?

LIGHT	SOUND	TOUCH

1. Poll the students to find out which stimulus they each reacted to most quickly. Record the data in the appropriate column of the chart.
2. Discuss these results, and ask individual students and teams to compare their results for reactions to light, sound, and touch.

3. Ask the students:

- Do you think the order in which you timed your various reactions affected the results?
- What are all the factors that you think might affect the results in these trials?
- Do you think you could change your reaction time? How?

4. Review the students' answers to the questions on their Student Sheets.

HEALTH APPLICATIONS

1. What are some situations in which reaction time is important?
2. How could you compensate for a slow reaction time if you were riding a motorcycle, driving a car, or riding a bike?

HAP SIDETRIPS

1. Find out if you react more quickly with your hand than with your foot.
2. Test your reaction times in different conditions: when you are tired, alert, angry, or excited.
3. Time your reaction to light when you have one eye covered. Does it make a difference which eye you cover?
4. Time the reactions of different age groups. If possible, time the reactions of elderly people. How does age seem to affect reaction times?



Open-House Night. Have your parents time their reactions when they visit your classroom. How do their reaction times compare to yours?



IMPROVING REACTION TIME

ACTION/REACTION Module



OVERVIEW

The students explore the effect of a training program on their reactions to light. This activity introduces the students to systematic collection and analysis of data.

HEALTH BACKGROUND

Reaction time, the amount of time an individual takes to respond to a stimulus, can be reduced through a training program. In order for a bicyclist to stop for a pedestrian in a crosswalk (stimulus), she must first see the person with her eyes. This information must then travel along the optic nerve to the brain, which processes the

information and signals the proper muscles to contract. The cyclist can then push back on the pedals (response) to stop. Alertness, muscle coordination, concentration, and proficiency are aspects of reaction time that can improve with continued practice in responding to sudden stimuli.

The reduction an individual can make in his reaction time depends on his present level of skill in controlling his body and his familiarity with the task he is doing. Although most individuals can show substantial improvement, there is a limit for a specific situation beyond which the body cannot react faster, no matter how much the individual trains.

By training to reduce their reaction times, the students again find that control of their bodies is, to a great extent, in their own hands. As they learn that they can improve certain abilities, they should realize the value of exercise and other fitness plans in maintaining and improving health. Specifically, the practice of any newly learned skill, such as driving a new vehicle, playing a new sport, reading, or solving math problems, involves reducing one's reaction time.

MATERIALS

For each team of four:

- 1 reaction timer
- 4 AA-cell batteries
- 4 copies of Student Sheet IRT*

For the class:

- 1 "Averaging the Data" Technique Card
- duplicator master of Student Sheet IRT

*Provided by the teacher.

SETTING UP

Suggested Time: Conduct *Reaction Time* before presenting this activity.

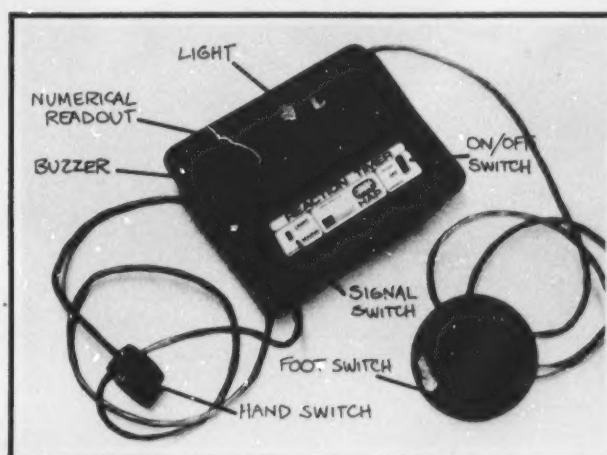
- Plan for 30 minutes for Part One.
- Plan for 15 minutes on each of five days (including today) for Part Two. Add 10 extra minutes for the fifth day.

Preparing for the Activity

1. Prepare the timers. Place four AA-cell batteries into the battery holder of each reaction timer as shown in the diagram on the holder. (Note: Remove the batteries after the activity if the timers will be stored for a while.)

2. Make sure you remember how the timer works.

- **Timing Switch.** The switch on the right side of the timer's face is for recording elapsed time. For hundredths of a second, push the switch *down*. For seconds, push it *up*. To turn the timer off, push the switch to the *middle* position.



- **Light and Sound Switch.** This switch is on the left side of the timer's face. To activate the light signal, push the switch *up*. To activate the sound signal, push the switch *down*.
- **Hand Switch.** Press and release the hand switch (the smaller of the two disks) to activate the chosen signal and the timer's clock.
- **Foot Switch.** Step on the foot switch (the larger disk) to stop the clock and turn off the signal. You can then read the elapsed time from the readout.
- Pressing and releasing the hand switch again automatically resets the clock to zero and starts it timing.

3. Duplicate the Student Sheet.

THE ACTIVITY: PART ONE

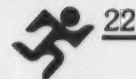
Introducing the Activity

1. Remind the students of the variation in reaction times they found during the *Reaction Time* activity.
2. Ask the students for suggestions on how they could reduce their reaction times.
3. Tell the students that they are going to conduct a training program in which they each respond to the light five times a day for five days.

Name _____

Improving Reaction Time Student Sheet IRT

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HAP SIDETRIP: Take-Home Reaction Timer. Ignore this section until the teacher asks you to work with it.

TRAINING TO REDUCE YOUR REACTION TIME

1. Conduct one trial before you start training, and record your before-training time in this oval.

 Day 0

2. Use a small X to plot this time on the graph for Day 0, and draw a dotted line across the graph at that time.

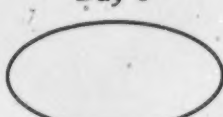
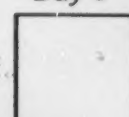
3. Now conduct five trials a day for five days in a row, starting today if your teacher says you have time.

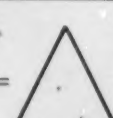
4. Plot the time for each trial on the graph. (You will have five X's for each day of practice.)

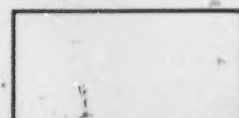
5. On the last day, average your five trials for that day, and record your average time in the square below. (Add the five numbers together and divide the total by 5.)

 Day 5

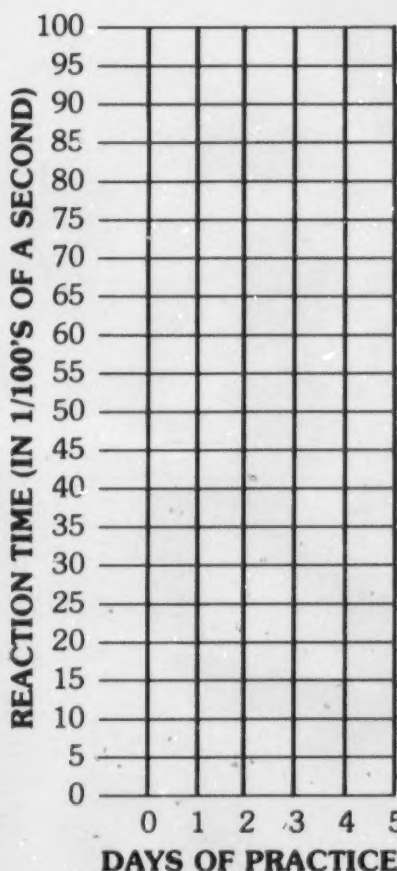
6. Calculate your *percent* improvement through these steps.

a.  Day 0  Day 5 = 

b.  × 100 = 

c.  ÷  = 

% IMPROVEMENT 14



cut along this dotted line

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20

18

16

14

12

10

0

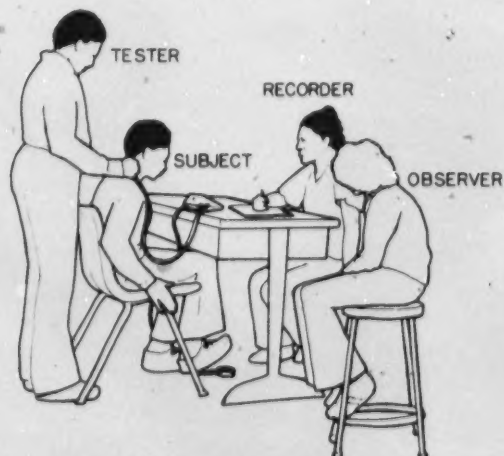
- Explain that the purpose of the experiment is to find out if training can reduce the time it takes them to react to light.
- Encourage them to design the exact procedure.
- Write the main points of their procedure on the board.

4. Explain that at the end of the training period, the students will compare their final reaction times to their before-training reaction times.

Reviewing the Reaction Timer. Remind the students that, just as in the *Reaction Time* activity, they should set the left switch on the timer *up* for a light signal and the right switch *down* for measuring hundredths of a second.

Establishing Pre-Training Reaction Times

1. Give each of the students a Student Sheet, and review the sheet with them.
 - Show the students how to draw a dotted line horizontally across their graphs to represent their before-training times. (See the graph in the following section.)
2. Divide the class into teams of four.
3. Give each team a reaction timer.
 - Remind the class that each student will find his before-training reaction time and record it in the oval on his Student Sheet *before* starting his five practice trials.
4. Let the teams begin.
5. If you have time today, you may want to start Part Two after your students have established their pre-training reaction times.



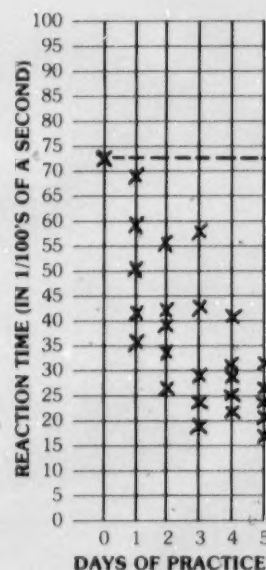
THE ACTIVITY: PART TWO



Timing Reactions During Training.

For the next five consecutive days, have the students conduct their five trials each day.

1. Either set aside a time when the whole class can run trials at once, or leave a few reaction timers out so teams can conduct their trials throughout the day.
2. Remind the students to plot their data with X's as described on the Student Sheet.
 - If the students are interested in a daily average, show them how to determine it by simple arithmetic.



Analyzing the Data

1. On the fifth day, after all the teams have completed their practice trials, help them compute their percent improvements (step 6 on the Student Sheet).
2. Poll the students to find out their percent improvements for their reaction times.
 - If the students are interested, you can average the improvement scores to get a percent-improvement score for the class as a whole.
 - Ask the students what their data tells them about the effect of training on their reaction times.

3. Ask several students to describe the pattern of the effect of training on their reaction times.

Ask the students:

- What do you think caused your daily fluctuations?
- What happened to your daily *range* as you continued practicing?

4. Hold up several graphs side by side so that the class can compare different patterns of improvement.

5. Ask the students:

- Do you think you have improved as much as you can?
- What evidence do you have that you can't improve more?
- How long do you think a training program for reducing reaction time should be?
- How long do you think the skill will remain with you if you don't practice every day? How could you find out? (Encourage interested students to carry out this study.)

HEALTH APPLICATIONS

1. You are trying out for the swim team. The coach says you are too slow in coming off the diving block after the starting gun. What could you do to improve your reaction time?

2. Your friend is very discouraged because she just failed to pass the speed reading test.

- What would you say to her?
- What could she do to improve her score?

HAP SIDETRIPS

1. Find out how different conditions (being tired, bored, distracted, or hungry) affect your improvement through training.

2. Find your improvement limit (meaning you can't improve any more) for a specific activity involving reaction time.

3. Set up training programs for reducing your reaction times when you respond to sound and to touch.



Take-Home Idea

1. Cut off the Take-Home Reaction Timer from your Student Sheet.

2. You can use this reaction-timer strip to time your family's and friends' reactions and then as a training tool to reduce their reaction times.

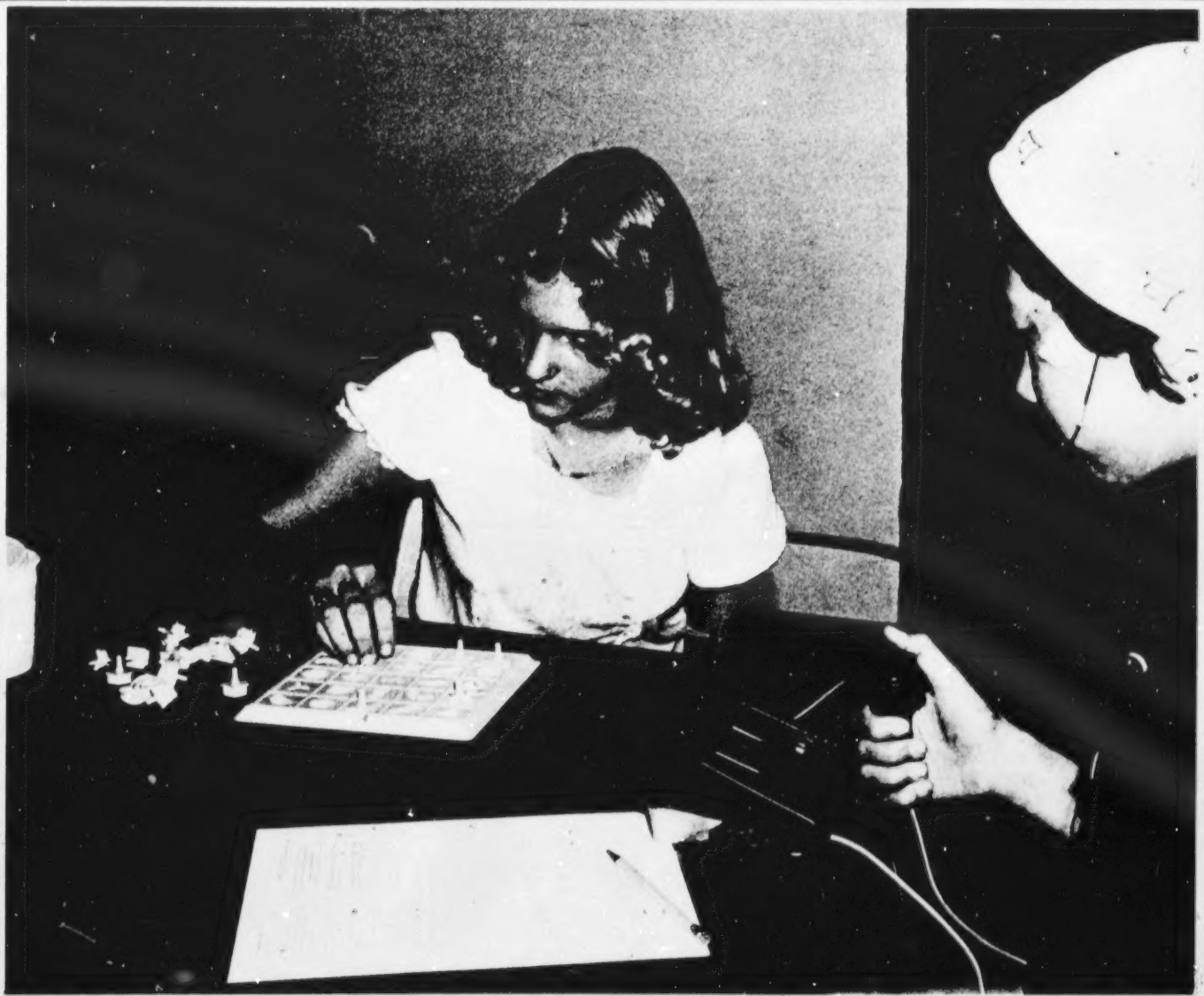
3. How to Use the Reaction-Timer Strip

- The SUBJECT (family member or friend) holds his thumb and forefinger about one centimeter apart.
 - You hold the reaction-timer strip by the end with this logo , positioning the zero mark between the SUBJECT's thumb and forefinger.
 - When you release the strip, the SUBJECT pinches it as fast as he can.
 - The number closest to his fingers indicates the length of time in hundredths of a second your SUBJECT took to react.
 - Have your SUBJECTS practice this task for a week. Keep track of their daily scores.
4. Share your results with the class.
- Did age seem to affect reaction time?
 - How much improvement did your SUBJECTS show?



LET'S MANIPULATE

ACTION/REACTION Module



OVERVIEW

By fitting contoured pieces into matching holes, the students practice their eye/hand coordination and discover that practice can improve their performance.

HEALTH BACKGROUND

Eye/hand coordination has everyday importance to a child's health and safety. She learns to avoid dangerous situations by responding with hand movements to external stimuli. For example, when deflecting a flying object heading for her, or turning her bicycle out of the path of a dog lunging at her, she avoids danger by

coordinating the response of her hands to visual stimuli. She also uses eye/hand coordination when putting keys in locks, playing ball, removing a splinter from her hand, writing, and turning pages in a book.

Through this activity, the students become more aware that training can improve performance at a given task or in the use of a new piece of equipment. The students again have the opportunity to exercise control over their bodies.

MATERIALS

For each team of four:

- 2 contoured-shapes game boards
- 2 plastic containers, each with 25 pieces
- 1 reaction timer
- 4 copies of each Student Sheet: LM 1* and LM 2*

For the class:

- 1 "Our Coordination Skills" chart
- 30 blue dots
- 30 red dots
- 1 eraseable crayon
- 1 "Averaging the Data" Technique Card
- duplicator masters of Student Sheets LM 1 and LM 2

*Provided by the teacher.

SETTING UP

Suggested Time: This activity should follow *Improving Reaction Time*.

- Plan for 35 minutes for Part One.
- Plan for 20 minutes on each of the next seven school days for Part Two. (Add an extra 10 minutes for the first day and for the last day.)

Preparing for the Activity

1. Prepare the timers. Place four AA-cell batteries into the battery holder of each timer. (Note: Remove the batteries from the timer after the activity if the timers will be stored for a while.)
2. Duplicate the Student Sheets.

Preparing for Part Two

1. Set out the game boards, pieces, and timers around the room at several distribution stations.
2. Post the class chart, and place the colored dots in the appropriate circles at the bottom of the chart.
 - On the first day, set out the blue dots.
 - On the seventh day, set out the red dots.

THE ACTIVITY: PART ONE

Introducing the Activity

1. Ask the students:
 - What does eye/hand coordination mean to you?
 - What do you do every day that involves eye/hand coordination?
2. Tell the students that today they are going to time their performances of an eye/hand coordination task.

Demonstrating the Procedure. Bring a team of four to the front of the room to demonstrate the procedure.

1. The Setup. Organize the students around a desk or table as follows:

- Two SUBJECTS perform the eye/hand coordination task. Each SUBJECT has a covered container and 25 pieces in front of him.
- The TIMER, who gives the signals, sits facing the reaction timer.
- The RECORDER checks to make sure that both SUBJECTS follow the procedure and records the performance times for both SUBJECTS.

2. Testing Eye/Hand Coordination

- Each SUBJECT piles his set of 25 pieces in front of him next to his covered container.
- The TIMER moves the timer's left switch up to the light position and the right switch up for measuring seconds.
- As the TIMER calls "GO" to the SUBJECTS, she starts the timer by pressing and releasing the hand switch.
- Each SUBJECT drops his pieces as fast as he can into the hole in the lid of his container.

SUBJECT's Name _____

TIMING YOUR EYE/HAND COORDINATION PERFORMANCE

1. SUBJECT: Make sure that you:
- Complete five trials.
 - Select the pieces from a bunched pile.
 - Pick up only *one piece at a time* using only *one hand*.
2. RECORDER: Record the SUBJECT's results in the table below.

TRIAL NUMBER	PERFORMANCE TIME IN SECONDS		
1			
2			
3			
4			
5			
TOTAL		÷5	=

3. SUBJECT: Average your scores by dividing the total by 5.
- How did the first and last trials compare with your average time?

- What do your five trials tell you about your ability to change your eye/hand coordination performance time?



SUBJECT's Name _____

TRAINING TO IMPROVE YOUR EYE/HAND COORDINATION PERFORMANCE TIME

1. Complete one trial before you start training. Make sure the RECORDER plots this time on the graph for Day 0 and records this before-training time in this oval.



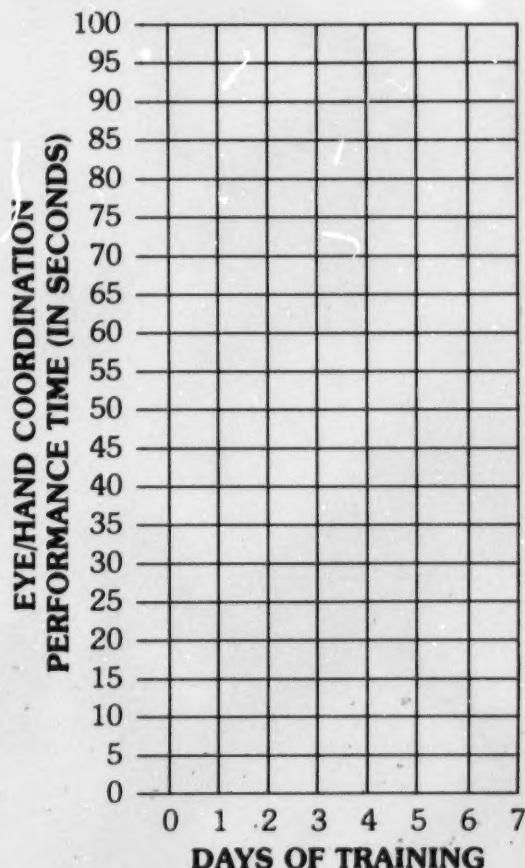
Day 0

- Use a blue dot to record this time on the class chart.
2. Now, conduct three trials a day for seven school days.
 - Make sure the RECORDER uses X's to plot the time for each trial on your graph. (You will have three X's for each day of practice.)
 3. On the last day, average your trials for that day, and record your average time in the square below. (Add the three numbers together and divide the total by 3.)



Day 7

- Record this value on the class chart with a red dot.
4. Calculate your percent improvement through these steps.



a. $\text{Day 0 (Oval)} - \text{Day 7 (Square)} = \text{Circle}$

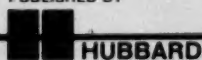
b. $\text{Circle} \times 100 = \text{Triangle}$

c. $\text{Triangle} \div \text{Oval} = \text{Rectangle}$

% IMPROVEMENT

20

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HEALTH ACTIVITIES PROJECT



- The SUBJECTS can each use only *one hand* and handle only *one piece at a time*.
- When a SUBJECT puts his last piece into the container, he calls "TIME."
- The TIMER immediately tells the RECORDER the time on the readout.
- The RECORDER checks to be sure the last piece is in and then records that time on the SUBJECT's Student Sheet.
- The recording process is repeated for the second SUBJECT when he has put in his last piece.
- After both SUBJECTS in a trial have completed the task, the TIMER can stop the timer by either pressing or stepping on the foot switch. Pressing and releasing the hand switch again will restart the timer.
- The students change roles until each has completed his five trials.



Testing Eye/Hand Coordination

1. Give each student a copy of Student Sheet 1, and review it with them.
2. Divide the class into groups of four.
3. Give each team a timer and two covered containers, each with 25 pieces.
4. Remind the students:
 - Drop the pieces as fast as you can into the hole, but using only *one hand* and handling only *one piece at a time*.
 - Rotate roles until you each have completed five trials.
 - Make sure the RECORDER records your time for each trial on your Student Sheet.
5. Let the teams begin.
6. After the teams finish, remind them to find their average performance times for the activity.
7. Collect the equipment.

Analyzing the Results

1. Ask the students:
 - Compare your first trial with your last trial.
 - What evidence do you have that you can improve your time?
 - What factors were involved that made it possible for you to put pieces in the container faster?
2. Review the students' answers to the questions on the Student Sheet.

THE ACTIVITY: PART TWO

Introducing Part Two. Tell the students that you have a training program you would like them to conduct to find out how much they can reduce their performance times for the eye/hand coordination task.

Explaining the Training Program

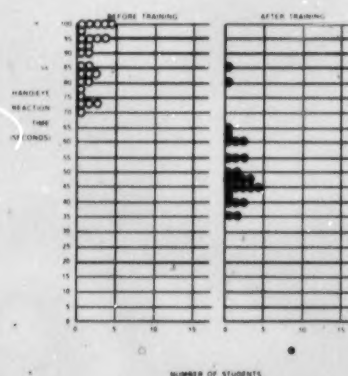
1. Show the students the game board.
2. Tell them that they will be using the same procedure that they used in the first part of the activity. This time, however, they will be fitting the pieces into matching holes.
 - Each student will complete three trials a day for seven days.
 - At the end of the training period, the students will compare their final performance times to their before-training performance times.



Establishing Pre-Training Performance Times

1. Give each student a copy of Student Sheet 2, and review it with them.
2. Explain the procedure.
 - Each student completes one before-training trial.
 - No practice is allowed before this trial.

OUR COORDINATION SKILLS



- After all the students in a team have completed their before-training trials, each student in the team places a blue dot next to his time in the "Before Training" column on the chart. Dots for the same time should be placed next to each other; they should not overlap.

3. Give each team a timer and two boards with pieces.

- Remind the class that each student should have his before-training performance timed and make sure that the RECORDER records the time in the oval on his Student Sheet.

4. Let the teams begin.

5. After the teams have established and recorded their before-training performance times, have them start their training trials.



Practicing Eye/Hand Coordination.

For the next seven school days, have the students conduct their three trials each day.

1. Either set aside a time when the whole class can run trials at once, or leave the game boards, pieces, and timers out so teams can conduct their trials throughout the day.

2. Remind the students to plot their data with X's as described on the Student Sheet.

Analyzing the Data

1. On Day 7, after the students have completed their training trials, put out red dots for the students to use to record their average times in the "After Training" column on the chart.

2. Before looking at the trend of the group data on the chart, help the students calculate their own percent improvement (step 4 on Student Sheet 2).

3. Average the before-training and after-training data on the chart by using the technique on the "Averaging the Data" Technique Card.

4. Ask the students:

- What do our class results show?
- How many of you improved more than 10%? 20%? 30%? 50%?

5. Ask individual students to describe what happened to their own times from day to day. (They should refer to their own graphs.)

- What happened to the range of times from Day 1 to Day 7?

- What effect did the weekend without practice have on your scores for Monday?
- Why do you think you were able to improve your time through training?
- How do you think practicing eye/hand coordination tasks such as the one in this game would help you improve at other tasks?
- Do you think you could improve even more?

HEALTH APPLICATIONS

1. Joe found that when taking allergy pills his eye/hand coordination scores were much worse. Knowing this, what activities might he plan to avoid when taking the pills?

2. Laura has glasses but does not like to wear them all the time. Why would it be important for Laura to determine if her eye/hand coordination is different when she takes off her glasses?

HAP SIDETRIPS

1. Design different types of tests for your eye/hand coordination abilities.

- What is the effect on your score when you use only your left eye or only your right eye?
- With which hand is your eye/hand coordination better?
- How is your eye/hand coordination when you play the game without using your thumb? (Tape your thumb to your hand.)

2. Check your score a week or two after you stop practicing every day. What happens to your score?



Open-House Night. Have your parents test their eye/hand coordination when they visit your classroom.

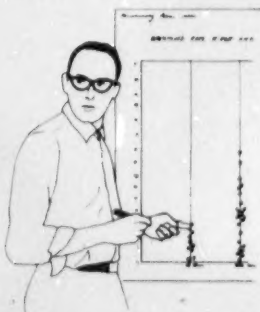


AVERAGING THE DATA

Technique Card

The Technique. For most HAP activities, a simplified averaging technique is quite acceptable for chart data. We are looking for trends, not exact values. You need not delay the class while someone calculates a numerical average. Instead:

1. Place your finger at the top dot in any column of data.
2. Look at the class. *Do not look at the chart.*

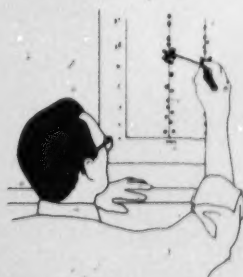


3. Tell the students to raise their hands when your finger reaches the *average* (the point that best represents all the dots), and to lower them if you go past that point.

4. Move your finger slowly down the entire column. Then move your finger back to the area where the most hands were raised. By moving your finger slowly up and down around this area, you will find the point that most accurately reflects the students' choice.

5. Use an eraseable crayon to mark that point with an X.

6. When appropriate, connect the average points in different columns to show a trend.



For Clarification. If the children have difficulty distinguishing between the arithmetic average and the middle of a clump of dots, try this technique.

1. Tape a piece of tissue or thin paper over a column of dots.
2. Trace the original dots onto the tissue.
3. Remove the tissue, turn it sideways, and tape it to the chalkboard.



4. Tell the students to pretend that the dot pattern is on a seesaw or balance board and the dots are objects of equal weight.

5. Ask them where you should place the support (fulcrum) so that the board would balance.

6. Mark that spot with an X.

7. Cover the original column of dots with the tissue again, and find out where the average would be on the original. Mark that point with an X.

